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Technological process modeling for castings according to specified parameters of output production quality based on production-frame model of knowledge representation

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Abstract

The article considers the modeling technique of casting technological process according to the required quality indicators of output products. They proposed the structure of an intellectual information system based on the presentation of knowledge using the frames and the rules of product selection. The system is designed to create and select the process parameters according to the required output product quality indicators, as well as to optimize the existing casting technological processes. The implementation of the developed system for the casting technological process from cast iron with vermicular graphite is presented using the built-in CLIPS programming language. As the initial information for the formation of the knowledge base the test results provided by PJSC "KAMAZ-Metallurgy" were used. The modeling of the technological process on the basis of the production-farm model of knowledge representation allows to eliminate the main disadvantages of the automated design systems used in the foundry industry at the present time: high requirements for necessary machine resources and personnel qualification. The application of the developed system will allow to reduce significantly time and financial costs for the preparation of production due to the reduction of real tests number necessary for the selection of optimal technological process parameters.

Keywords

Base of rules, Cast iron with vermicular graphite, Frames, Knowledge base, Production model of knowledge representation

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